CLAIMS

1. A belt type continuous plate manufacturing apparatus comprising two endless belts so placed that their facing belt surfaces run toward the same direction at the same speed, and continuous gaskets running under condition of being sandwiched by belt surfaces at their both side edge portions, wherein a polymerizable raw material is fed into a space surrounded by the facing belt surfaces and the continuous gaskets from its one end, the polymerizable raw material is solidified together with running of the belts in a heating zone, and the plate polymer is taken out from the other end, characterized in that

a plurality of upper and lower roll pairs each composed of an upper roll in contact with the upper surface of the upper belt and a lower roll in contact with the lower surface of the lower belt and having axes orthogonally crossing the belt running direction are placed along the belt running direction as a belt surface holding mechanism for the endless belts facing each other and running in the heating zone, and the outer diameter D of the roll body portion of the upper and lower roll pair is in the range of 100 mm to 500 mm.

2. The belt type continuous plate manufacturing apparatus according to claim 1, wherein the widths of the two endless belts are both 1800 mm or greater, and the outer diameter D of the roll body portion of the upper and lower body pair is in the range of 130 mm to 500 mm.

3. The belt type continuous plate manufacturing apparatus according to claim 1, wherein a difference [P-D] between an arrangement distance P of a plurality of upper and lower roll pairs in the belt running direction and the outer diameter D of the roll body portion is in the range of 50 mm to 500 mm.

4. The belt type continuous plate manufacturing apparatus according to claim 1, wherein when the total number of upper and lower roll pairs is set to 100%, the

roll body portion of the lower roll of said upper and lower roll pairs in a number of 4% or greater has a crown shape.

5. The belt type continuous plate manufacturing apparatus according to claim 4, wherein when a district from an inlet to an outlet of the heating zone is set to 0% to 100%, upper and lower roll pairs with the lower roll portion having a crown shape are placed in a district of 0% to 90%.

6. The belt type continuous plate manufacturing apparatus according to claim 4, wherein when a district from an inlet to an outlet of the heating zone is set to 0% to 100%, upper and lower roll pairs with the lower roll portion having a crown shape are placed in a district of 30% to 90%.

7. The belt type continuous plate manufacturing apparatus according to claim 4, wherein in the crown shape of the roll body portion of the lower roll, a crown amount x represented by half a difference in diameter between the outermost diameter d_1 of the end portion of the roll body portion and the outermost diameter d_2 of the central portion shown by the following formula (1) and a self-weight deflection amount x of the roll body portion calculated from the following formula (2) satisfies the following formula (3):

$$x=(d_2-d_1)/2 \quad \text{... (1)}$$

$$y=5S\times\rho\times RW^4/(384\times E\times I) \quad \text{... (2)}$$

$$x\geq y \quad \text{... (3)}$$

S: area of cross section vertical to axis direction of roll body portion

ρ: density of material of roll body portion

RW: width of roll body portion

E: Young's modulus of material of roll body portion

I: secondary moment of cross section vertical to axis direction of roll body portion.

8. The belt type continuous plate manufacturing apparatus according to claim 1, wherein all the upper rolls of the upper and lower roll pairs are flat rolls in which the tolerance of the outermost diameter of the roll body portion is 0.1 mm or less.

9. The belt type continuous plate manufacturing apparatus according to claim 1, wherein the surfaces of the two endless belts in contact with a polymerizable raw material are mirror-polished so that the value of surface roughness Ra specified by the JIS roughness shape parameter (JIS B0601-1994) is 0.1 μm or less, and the maximum diameter of pinholes is 250 μm or less.

10. A method of producing a plate polymer, characterized in that a plate polymer is obtained from a polymerizable raw material containing methyl methacrylate using the belt type continuous plate manufacturing apparatus according to claim 1.

11. The method of producing a plate polymer according to claim 10, said method using a belt type continuous plate manufacturing apparatus in which when the total number of upper and lower roll pairs placed at a position nearer to the raw material feeding side than a position showing a peak by heat polymerization in a heating zone in the process in which the polymerizable raw material is solidified while running with the belt is set to 100%, the number of said upper and lower roll pairs with the lower roll body portion having a crown shape is 4% or greater.

12. The method of producing a plate polymer according to claim 11, said method using a belt type continuous plate manufacturing apparatus in which when a district from an inlet of a heating zone to a position showing a peak by heat polymerization in the process in which the polymerizable raw material is solidified while running with the belt is set to 0 to 100%, upper and lower roll pairs with the lower roll portion having a crown shape are placed in a district of 0% to 90%.

13. The method of producing a plate polymer according to claim 11, said method using a belt type continuous plate manufacturing apparatus in which when a district from an inlet of a heating zone to a position showing a peak by heat polymerization in the process in which the polymerizable raw material is solidified while running with the belt is set to 0 to 100%, upper and lower roll pairs with the lower roll portion having a crown shape are placed in a district of 30% to 90%.

14. A method of producing a plate polymer, characterized in that using the belt type continuous plate manufacturing apparatus according to claim 1 in which a lower roll axis of the upper and lower roll pair is supported on a fixed side wall, an upper roll axis of the upper and lower roll pair is supported on a beam capable of moving up and down, and a spring is placed in contact with said beam,

the amount of width direction deflection of upper and lower rolls is adjusted by adjusting a linear load applied to the belt surface by the upper roll by changing the compression length or extension length of said spring, and a plate polymer is obtained from a polymerizable raw material containing methyl methacrylate.

15. The method of producing a plate polymer according to claim 14, wherein the linear load applied to the belt surface by the upper roll is adjusted to be in the range of 10 kg/m to 200 kg/m per unit width of the belt.

16. A method of producing a plate polymer, characterized in that a plate polymer is obtained from a polymerizable raw material containing methyl methacrylate using the belt type continuous plate manufacturing apparatus according to claim 9.